

# Some Results of Tuberculin Testing of School Children in Northern Ireland

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As no figures were available concerning the tuberculin sensitivity in the general child population in Northern Ireland, it was decided to test as many as possible of the children in elementary schools in Belfast at the time of their first routine school medical examination during 1950. It had been intended to test the children during their first year of attendance at school, but it was much more convenient to obtain consent of parents in conjunction with arrangements for the first medical inspection.

Subsequently, when the Medical Research Council was asked for funds to assist in the enquiry, it was learned that a survey was taking place in England, in which school children in each age group up to 16 were being tested. Accordingly, the testing survey was extended to give comparable findings for children in Northern Ireland, by testing other children in Belfast and in country districts.

The findings are set out below. Part I refers to the young children in Belfast and Part II to the children in each age group in Belfast and in less urban districts in Northern Ireland.

## PROCEDURE.

In each instance the consent in writing of the parents was given before the child was tested.

Each parent was sent an explanatory form, and if consent was not given or no reply was received, a health visitor visited the home and tried to persuade the mother to agree; in this way the total proportion of consents was raised by about 10 per cent.

## TECHNIQUE.

The test method was that used by the Medical Research Council in a survey of tuberculin reactions in children in England. Each child was first given an inter-scapular patch test, using 60 per cent. old tuberculin jelly (A. and H.). An area just to one side of the spine was cleaned with acetone on cotton wool. It was then stroked lightly six times with a 1" wide strip of grade 00 sand paper.

About  $\frac{1}{2}$ " of the jelly from the tube was then applied and the area covered with a small strip of adhesive tape and the test was read ninety-six hours later.

In the first 500 children a control test with A. and H. control jelly was given at the same time, but it was not used thereafter, as pseudo reactions did not occur.

This test was taken as positive if four or more vesicles or a single large vesicle occurred on an area of erythema.

All children whose patch test was doubtful or negative were given an intradermal test with 1/100 (1.0 mgms.) old tuberculin. A positive reaction was

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TABLE I  
Numbers of Young Belfast Children whose Parents were asked to Permit Tests.  
Numbers of refusals, Uncompleted and Completed Tests.

AGE	5			6			7			Total.				
BOYS				No.	%	No.	%	No.	%	No.	%			
Total in Survey	...	...	...	1366	- 100	...	2439	- 100	...	684	- 100	...	4489	- 100
No. of Refusals	...	...	...	181	- 13.25	...	377	- 15.46	...	135	- 19.74	...	693	- 15.44
No. Absent (Consenters)	...	...	...	177	- 12.96	...	317	- 13.00	...	107	- 15.64	...	601	- 13.39
Incompleted Tests	...	...	...	64	- 4.69	...	135	- 5.54	...	41	- 5.99	...	240	- 5.35
Total Tested	...	...	...	944	- 69.11	...	1610	- 66.01	...	401	- 58.63	...	2955	- 65.83
GIRLS														
Total in Survey	...	...	...	1395	- 100	...	2412	- 100	...	675	- 100	...	4482	- 100
No. of Refusals	...	...	...	194	- 13.91	...	387	- 16.04	...	142	- 21.04	...	723	- 16.13
No. Absent (Consenters)	...	...	...	202	- 14.48	...	324	- 13.43	...	99	- 14.67	...	625	- 13.94
Incompleted Tests	...	...	...	79	- 5.66	...	114	- 4.73	...	34	- 5.04	...	227	- 5.06
Total Tested	...	...	...	920	- 65.95	...	1587	- 65.80	...	400	- 59.25	...	2907	- 64.86

TABLE II  
 Results of Tuberculin Jelly and 1 Intradermal Mantoux Tests on  
 100  
 Young Belfast Children.

AGE	5			6			7			Total
<b>BOYS</b>										
Total Tested	...	...	...	No.	%	No.	%	No.	%	No.
	...	...	...	944	- 100	...	1610	- 100	...	401
Positive to Jelly	...	...	...	212	- 22.46	...	345	- 21.43	...	94
Positive to 1	...	...	...	35	- 3.71	...	71	- 4.41	...	10
100	...	...	...	247	- 26.17	...	416	- 25.84	...	104
Total Positive	...	...	...	247	- 26.17	...	416	- 25.84	...	104
<b>GIRLS</b>										
Total Tested	...	...	...	920	- 100	...	1587	- 100	...	400
Positive to Jelly	...	...	...	212	- 23.04	...	315	- 19.85	...	92
Positive to 1	...	...	...	33	- 3.59	...	42	- 2.65	...	9
100	...	...	...	245	- 26.63	...	357	- 22.51	...	101
Total Positive	...	...	...	245	- 26.63	...	357	- 22.51	...	101

TABLE III

Results of jelly and  $\frac{1}{100}$  intradermal tuberculin tests in

AGE	5		6		7		8		9	
<b>BOYS</b>	No.	%	No.	%	No.	%	No.	%	No.	%
Total Tested	188	- 100	142	- 100	177	- 100	167	- 100	162	- 100
Positive to Jelly	37	- 19.7	30	- 21.1	43	- 24.3	44	- 26.3	55	- 33.9
Positive to $\frac{1}{100}$	3	- 1.6	4	- 2.8	5	- 2.8	3	- 1.8	9	- 5.6
Total Positive	40	- 21.3	34	- 23.9	48	- 27.1	47	- 28.1	64	- 39.5
<b>GIRLS</b>										
Total Tested	177	- 100	183	- 100	181	- 100	156	- 100	140	- 100
Positive to Jelly	32	- 18.1	34	- 18.6	40	- 22.1	39	- 25.0	44	- 31.4
Positive to $\frac{1}{100}$	6	- 3.4	9	- 4.9	5	- 2.8	9	- 5.8	7	- 5.0
Total Positive	38	- 21.5	43	- 23.5	45	- 24.9	48	- 30.8	51	- 36.4

recorded when there was an area of palpable infiltration 5 ms. or more in diameter when the test was read at the end of 72 hours. A few marked reactions with areas of infiltration up to 25 ms. in diameter were encountered, but in no case was there any necrosis or ulceration.

#### PART I.

An attempt was made to test every child having his first routine medical examination in school during the year 1950. Table I shows the numbers and proportions of children tested and children not tested in the three age groups. It will be seen that absence from school either at the time intended for first testing or when a reading was required accounted for more than half of all the children not tested. To have returned to the schools to attempt to include such children would have entailed much additional time and considerable further upset of school routine.

It seems fruitless to speculate on the possible bias in the results due to the omission of about 35 per cent. of the children who were summoned for routine examination over the year.

There are about nine thousand children in each year age group in Belfast elementary schools. Depending on the time of year when they first attend a given

TABLE III

groups of Belfast children in age group 5 to 15 years.

10		11		12		13		14		15	
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
...148 - 100		...143 - 100		...179 - 100		...153 - 100		... 57 - 100		...15 - 100	
... 63 - 42.6		... 58 - 40.6		... 68 - 38.0		... 63 - 41.2		... 24 - 42.1		... 7 - 46.7	
... 5 - 3.4		... 10 - 7.0		... 11 - 6.1		... 14 - 9.2		... 6 - 10.5		... 3 - 20.0	
... 68 - 46.0		... 68 - 47.6		... 79 - 44.1		... 77 - 50.4		... 30 - 52.6		...10 - 66.7	
...109 - 100		...142 - 100		...168 - 100		...163 - 100		...59 - 100		...10 - 100	
... 49 - 45.0		... 50 - 35.2		... 49 - 29.2		... 45 - 27.6		... 12 - 20.3		... 1 - 10.0	
... 12 - 11.1		... 11 - 7.7		... 23 - 13.7		... 26 - 16.0		... 13 - 22.0		... 2 - 20.0	
... 61 - 56.0		... 61 - 42.9		... 72 - 42.9		... 71 - 43.6		... 25 - 42.3		... 3 - 30.0	

school and whether they attend for examination in that year, their first school medical inspection (and in this year their test) may be while they are 5, 6 or 7 years of age.

Table II sets out the numbers and proportions giving positive reactions to the jelly test and to intradermal 1/100 O.T. by sex and age.

#### PART II.

In order to get figures comparable with the Medical Research Council data for England and Wales, children in each age group from 5-16 were tested in Belfast and in three provincial towns in selected schools where most of the children were country dwellers. These centres were Londonderry, Ballyclare (County Antrim), and Omagh (County Tyrone).

It was impossible to derive a satisfactory sample of the school populations for Part II of the investigation. Experience has shown that the proportion of acceptances is much higher if the parents of all the children in a school in an age group or class are asked to give permission than if isolated children in a school are picked out in a sample. In addition, the extra travelling involved in testing a random sample of the school population would have made the work extremely difficult. Finally, the upset to so many small schools which would have been

TABLE IV.

Results of jelly and  $\frac{1}{100}$  intradermal tuberculin tests in schools  
children were

AGE	5		6		7		8		9	
<b>BOYS</b>	No.	%	No.	%	No.	%	No.	%	No.	%
Total Tested	149	- 100	157	- 100	195	- 100	203	- 100	165	- 100
Positive to Jelly	31	- 20.8	45	- 28.7	62	- 31.8	75	- 37.0	63	- 38.2
Positive to $\frac{1}{100}$	6	- 4.0	5	- 3.2	9	- 4.6	16	- 7.9	15	- 9.1
Total Positive	37	- 24.8	50	- 31.8	71	- 36.4	91	- 44.8	78	- 47.3
<b>GIRLS</b>										
Total Tested	98	- 100	118	- 100	153	- 100	159	- 100	135	- 100
Positive to Jelly	23	- 23.5	30	- 25.4	49	- 32.0	53	- 33.3	62	- 45.9
Positive to $\frac{1}{100}$	6	- 6.1	3	- 2.5	11	- 7.2	10	- 6.3	8	- 5.9
Total Positive	29	- 29.6	33	- 28.0	60	- 39.2	63	- 39.6	70	- 51.9

occasioned by testing children chosen at random from County Education Department rolls would have interfered too much with school work.

Accordingly, what appeared to be representative schools (taking mostly country children) in the three centres were chosen and as many children as possible in each school were tested.

The children for the Belfast sample were derived by selecting what appeared to be representative schools without reference to previous testing of entrants. The same techniques were used as in Part I tests, but no records were kept of the proportions of refusals, as these were not required by the Medical Research Council. In each school the head teacher obtained as many consents as possible from the parents of his or her pupils.

The findings are set out in Tables III and IV.

An investigation such as was carried out would be impossible without the help of many people. The expense of the investigations was met by the Medical

TABLE IV.

in Ballyclare, Omagh, and Londonderry, where the majority of the country dwellers.

10		11		12		13		14		15	
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
...181 - 100		...180 - 100		...166 - 100		...244 - 100		...188 - 100		...159 - 100	
... 85 - 47.0		... 82 - 45.6		... 70 - 42.1		...121 - 49.6		...106 - 56.4		...90 - 56.6	
... 13 - 7.2		... 10 - 5.6		... 15 - 9.0		... 16 - 6.6		... 6 - 3.2		...13 - 8.2	
... 98 - 54.1		... 92 - 51.1		... 85 - 51.2		...137 - 56.1		...112 - 59.6		...103 - 64.8	
...142 - 100		...141 - 100		...157 - 100		...138 - 100		... 90 - 100		...90 - 100	
... 59 - 41.5		... 59 - 41.8		... 71 - 45.2		... 79 - 57.2		... 43 - 47.8		...46 - 51.1	
... 7 - 4.9		... 18 - 12.8		... 7 - 4.5		... 6 - 4.3		... 6 - 6.7		... 3 - 3.3	
... 66 - 46.5		... 77 - 54.6		... 78 - 49.7		... 85 - 61.6		... 49 - 54.4		... 49 - 54.4	

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